



Centurion

TRANSPIRATOR II

equine respiratory system

USER'S MANUAL

INTRODUCTION

This Manual provides users of the CENTURION TRANSPIRATOR II™ System with information required for safe and effective use of the device. The CENTURION TRANSPIRATOR II System provides intermittent water-vapour saturation of a horse's inhalation to hydrate the airways and to promote mucous clearance. The CENTURION TRANSPIRATOR II delivers air saturated to 100% relative humidity at 105F +/- 3F at a flow rate exceeding the resting peak inhalation flow of the adult horse. This heated and humidified air is administered via a muzzle mask, which diffuses and directs the flow to avoid entrainment of ambient and also minimizes flow noise.

The CENTURION TRANSPIRATOR II System is designed to operate over a wide range of ambient temperatures and humidifies without operator adjustment. In fact, the cabinet is sealed at the factory to prevent tampering with the temperature and safety circuits. As with any electrical appliance, the operator must read, understand and follow correct procedures to prevent potential injury to the animal or himself.

The manual is arranged for easy reference.

- SECTION 1 use of the CENTURION TRANSPIRATOR II System.
- SECTION 2 recommended treatment schedules, commonly asked questions, and pre-race conditioning of healthy horses.
- SECTION 3 description of the device.
- SECTION 4 specifications.
- SECTION 5 step-by-step operating instructions (these are summarized, with operating cautions, in APPENDIX 1).
- SECTION 6 procedures for servicing and troubleshooting.

CENTURION TRANSPIRATOR II systems are available for both 115 and 220-volt operation. Be sure to specify the appropriate systems for your use. This manual applies to both systems.

If after studying this Manual you have further questions, contact Centurion as follows:

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OTHER COUNTRIES:	+44 28 94 433 666
E-MAIL:	info@centurion-systems.co.uk
WEBSITE:	www.centurion-systems.co.uk

SECTION 1. USE OF THE CENTURION TRANSPIRATOR II

The CENTURION TRANSPIRATOR II System is used for providing additional inspired humidity to eliminate airway heat and water loss. It is useful for:

- Respiratory conditioning of healthy horses.
- Promoting mucous clearance and reducing resistance to air movement in the bronchioles and other passages in the lungs.

Contraindications for use of the CENTURION TRANSPIRATOR II System are:

- Ambient temperature exceeds 90F or humidity is oppressive.
- Horse is overheated from exercise or weather.
- In a veterinarian's judgement, the body temperature of a sick horse increases unreasonably during therapy.

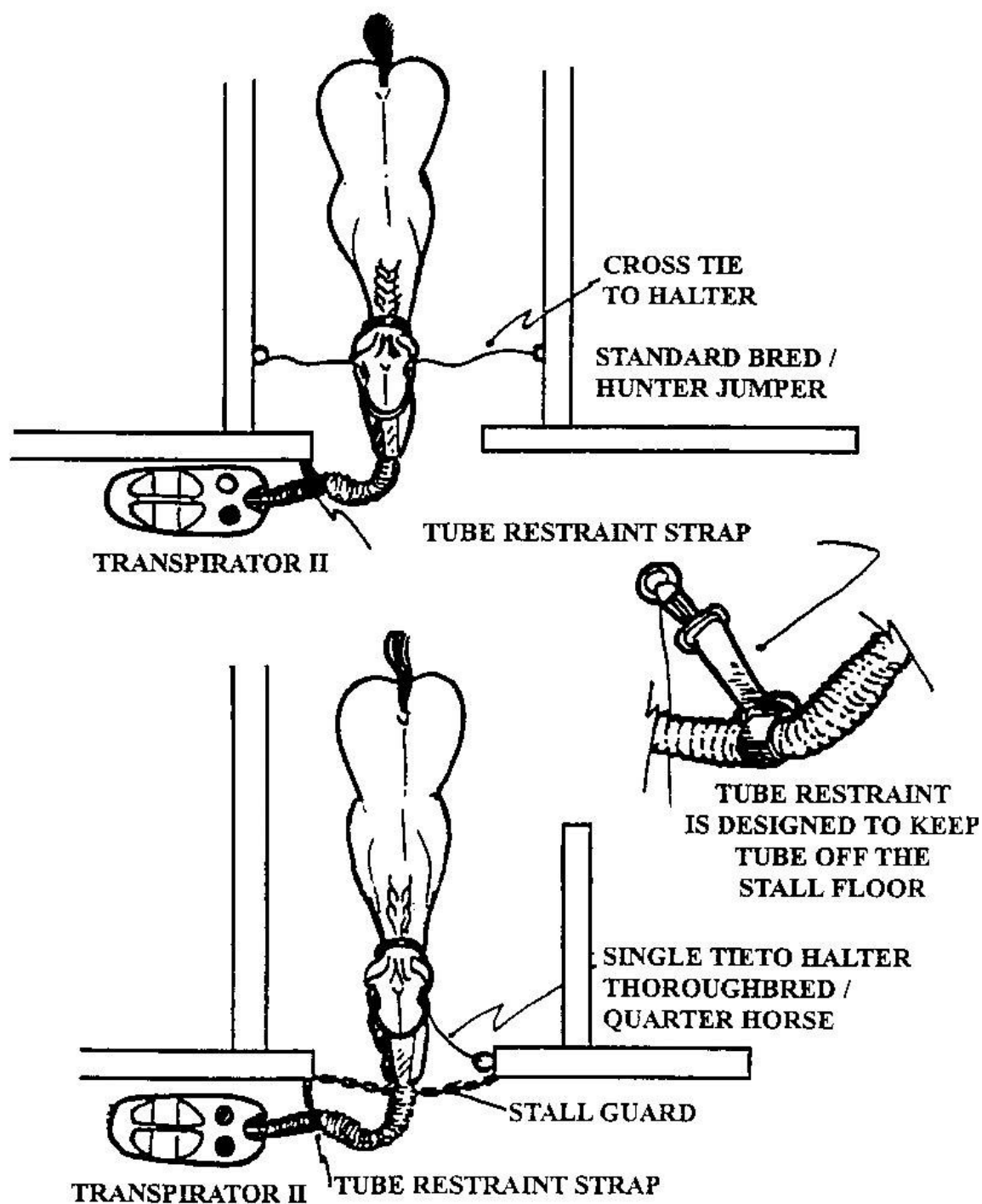
The CENTURION TRANSPIRATOR II is designed for use with all breeds of horses, from foals to adults. The air output is saturated to 100% relative humidity at 105F +/-3F. The flow rate is also fixed, exceeding the peak inhalation flow rate of the largest, resting horse. In other words, the water vapour concentration and temperature of inspired air are always the same, regardless of the horse's size.

The heated and humidified air is administered by a open Muzzle Mask such that air velocity and flow noise will not disturb the horse and such that the horse can breathe comfortably and safely in the event of flow interruption, e.g., power failure.

The CENTURION TRANSPIRATOR II is basically an ON-OFF device, with performance safety monitors, but with no adjustments. The only operator variable is treatment time, up to a maximum of 2-1/2 hours, limited by the water reservoir capacity. Out-of-water, tip-over, Delivery Tube disconnects, and other automatic protective functions in the CENTURION TRANSPIRATOR II are detailed in SECTION 3 and 5.

The most common set-ups for the CENTURION TRANSPIRATOR II are shown in FIGURE 1. Thoroughbreds are normally restrained behind a stall guard by one tie to the right side of a stall door. The CENTURION TRANSPIRATOR II unit is placed on the left side of the door so that the digital temperature display and water level sight tube will be visible to the operator from the stall door. The power cord is routed such that it is out of hoof and mouth reach of the horse and such that any excess cord is not a trip hazard to passing traffic. The CENTURION TRANSPIRATOR II Delivery Tube is restrained by a strap on the left side of the stall door to hold the tube off the floor. This is to keep the horse from stepping on the tube, while providing sufficient slack to prevent him from pulling on the tube. Most standard-breds are restrained with cross ties inside the stall; otherwise the CENTURION TRANSPIRATOR II set-up is the same.

Figure 1. Typical Stall Set-up



We recommend that all horses be "introduced" to the Muzzle Mask after the Delivery Tube has been attached and output air temperature has stabilized. Bring the mask slowly over the muzzle a few times, or preferable, let the horse "discover" the mask and soothing airflow. Most horses will accept the mask within a few minutes and will become drowsy and docile within 15 minutes.

We have found that foals will "discover" a Muzzle Mask hung over a stall door and voluntarily put their muzzle in for obvious relief. They will stand voluntarily for hours until they fall asleep. While lying down, they will voluntarily stretch to get their nose into a mask placed nearby. We have also found foals that require considerable persuasion to get the mask on and a restraint to keep it on.

1.1 **GENERAL USE-RELATED CAUTIONS**

(See SECTION 5 and APPENDIX I for unit operating cautions)

1. Always consult your veterinarian when using the CENTURION TRANSPIRATOR II System on a sick or medicated animal.
2. Never leave a horse unattended while using the CENTURION TRANSPIRATOR II System.
3. Do not use the CENTURION TRANSPIRATOR II System on days when the ambient temperature exceeds 90F or when the horse is overheated from exercise.
4. Do not use CENTURION TRANSPIRATOR II System if output temperature exceeds 109F.
5. The CENTURION TRANSPIRATOR II systems is not intended as a replacement for routine drug therapies.
6. Do not add drugs, medication, or anything else to the CENTURION TRANSPIRATOR II. The CENTURION TRANSPIRATOR II System delivers only vapour-phase water.
7. Always follow the operating and maintenance instructions in this Manual.

SECTION 2. TRANSPIRATOR II TREATMENT

The CENTURION TRANSPIRATOR II System filters and preconditions a horse's entire inhalation flow with droplet-free water vapour saturated at approximately 105F. During CENTURION TRANSPIRATOR II treatment the upper airways do not have to supply heat to warm inhaled air or water vapour to humidify it because the air delivered to the horse is already warmed and humidified to slightly above normal body conditions. This prevents airway heat and water loss and deposits a thin film of condensation on the walls of the respiratory tract. Retained and condensed water thins the mucous blanket, dissolves mucous plugs and promotes mucocilliary clearance.

In contrast, under normal ambient conditions, the upper airway must supply both the energy to warm and humidify inhaled air and the water needed for humidification. Although the CENTURION TRANSPIRATOR II System eliminates airway cooling, we have never observed a rise in rectal temperature during two-hour treatment periods. This is not surprising since the added energy from the CENTURION TRANSPIRATOR II System is still small relative to a horse's total metabolic heat.

The CENTURION TRANSPIRATOR II System cannot be used to administer drugs because it adds only water vapour to the delivered air. It is not a cure for disease or infection problems and is not intended to replace drug or antibiotic therapies. Its only functions are to help clear secretions and to help hydrate the airways.

The CENTURION TRANSPIRATOR II System is not a nebulizer. Nebulizers deliver aerosol particles of water or medication, whereas the CENTURION TRANSPIRATOR II System delivers only vapour (gas) phase water. Aerosol particles cannot penetrate into the small bronchioles of the lung and cannot humidify inhalation until they evaporate. This requires energy from the horse. Hence, a nebulizer will tend to cool the airways rather than warm them as the CENTURION TRANSPIRATOR II System does.

Usually the animals have become tranquil within 15 minutes and have drowsed without complaint for repeated two-hour treatment periods. When horses get restless during a treatment, we find that a brief interruption to permit urination is appropriate.

Although we have had no reports of adverse reactions even on hot, humid days, we are concerned about heat prostration. We strongly recommend against use when ambient temperature exceeds 90F, when humidity is oppressive, or when the horse appears overheated from the weather or exercise. When treating sick horses, especially those running fevers, we recommend careful monitoring of rectal temperature and veterinary supervision.

2.1 TREATMENT SCHEDULE

2.1.1 Treatment Protocol

- 2 Hours per day for 7 consecutive days.
- 50 minutes - 1 hour per treatment session after the first week.

NOTE:

- During the first week, on the 3rd, 4th, 5th & 6th days, it can be quite normal to experience worse performance from your animal, as mucocilliary clearance is enhanced.
- While the first 7 days must be consecutive, a missed day or two per week starting from the 2nd week is quite normal.

2.1.2 Pre-race Conditioning

Almost any horse living in a dry dusty barn environment may benefit from a clean respiratory tract during training or racing. We recommend pre-race conditioning treatment consisting of five one-hour CENTURION TRANSPIRATOR treatments, one each of the four days before a race and on race day. CENTURION TRANSPIRATOR II treatments are suggested during the three to five days before any hard workouts. The race-day or workday treatment should be completed at least five hours before the race or hard workout and should only be one hour.

2.1.3 Sick Horses

Always consult your veterinarian before treating a sick horse. If treating horses with respiratory disorders such as viral infections, bronchitis, chronic cough, sinusitis and pneumonia, continue daily two-hour treatments in conjunction with normal veterinary cure until horse has recovered. Additional daily two-hour treatments may prove beneficial. Allow the horse two hours of CENTURION TRANSPIRATOR II unit between treatments. Always consult a veterinarian and monitor rectal temperature on horses running a fever, especially on warm, humid days.

2.1.4 "Bleeders"

Any horse having experienced exercise-induced pulmonary haemorrhage must be allowed at least 14 days without strenuous exercise before its next race. This time is required to allow the lung injury to heal. Begin treating the horse four or more days before the race as outlined in 2.1.1 Pre-race Conditioning.

Do not hesitate to use the CENTURION TRANSPIRATOR II in conjunction with Lasix.

2.2 **COMMONLY ASKED QUESTIONS ABOUT
CENTURION TRANSPIRATOR II TREATMENT**

1. How often should I use the CENTURION TRANSPIRATOR II System with my horse?

The original treatment schedule consists of seven two-hour treatments. This includes the treatment on the day of the race or strenuous workout. Many of the trainers we have spoken with, have reduced this to one hour per day and they are quite content with the results.

2. Can I use the CENTURION TRANSPIRATOR II System on race day?

Yes. Many of the trainers we've spoken to use the system on the day of the race. It would seem wise to allow several hours between the treatment and the race for the animal to clear any mucous which may have been loosened by the humidity.

3. Can the CENTURION TRANSPIRATOR II System be used on a daily basis?

Yes. The system is being used this way by a number of trainers. During the dry winter racing season, the CENTURION TRANSPIRATOR II System is especially helpful in providing humidity to the respiratory tract and reducing airway water loss and cooling.

4. How do I use the CENTURION TRANSPIRATOR II System to administer medication?

The CENTURION TRANSPIRATOR II System cannot be used to apply medication of any type. Do not put any substance into the machine except distilled water.

5. My horse is a bleeder and is currently on Lasix. Can I use the CENTURION TRANSPIRATOR II System while my horse is on Lasix?

Yes. We see no reason why the two cannot be used together. If you have any questions about a specific animal, be sure to check with your veterinarian before using the system.

6. I already have a nebulizer. Is it the same as the CENTURION TRANSPIRATOR II system?

No. A nebulizer breaks water into tiny particles and sends them down the tube to the animal. The CENTURION TRANSPIRATOR II System provides only pure water vapour at a precisely controlled temperature. The output volume of the CENTURION TRANSPIRATOR II System far exceeds any other product on the market and is sufficient to cover the animals entire inhalation.

7. Does the CENTURION TRANSPIRATOR II System cause an increase in the horses body temperature?

We have no indication of an increase in body temperature during treatment. Rectal temperatures have been taken during and after treatment and no temperature rises have been observed. Remember that we do not recommend treatment when the outside temperature is above 90 degrees (F) or when the humidity is oppressive.

8. Can the CENTURION TRANSPIRATOR II System spread an infection from horse to horse?

The system should be disinfected before use according to the directions in this manual. The disinfectant, which we pack with each unit, is a powerful, broad-spectrum sterilant, which kills an enormous array of microorganisms on contact and leaves only salt when dry. A properly disinfected unit is far less likely to spread or create infection than the water buckets you are probably using right now.

Figure 2A. Centurion Transpirator II Features.

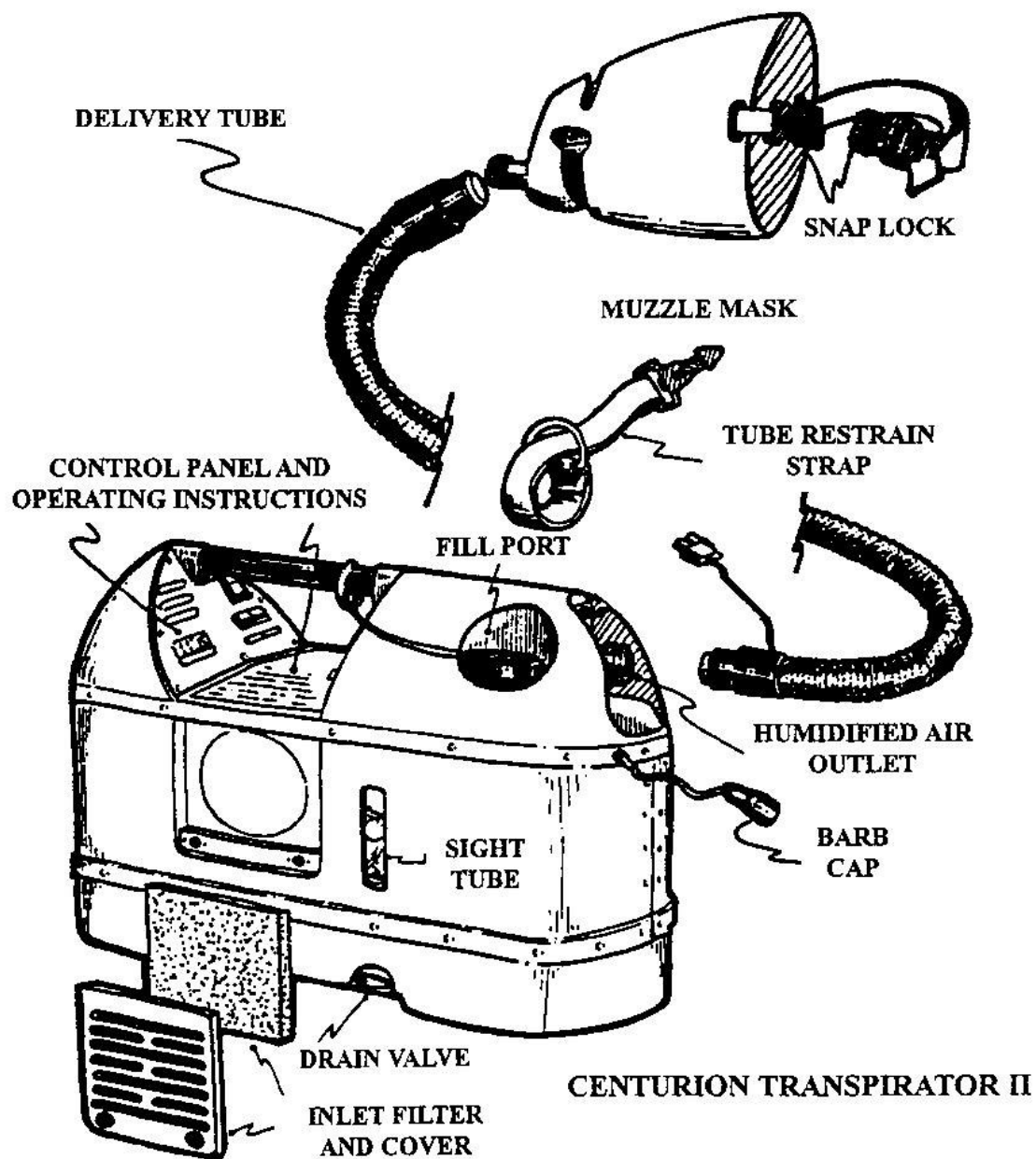
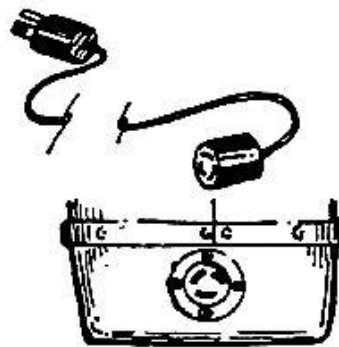


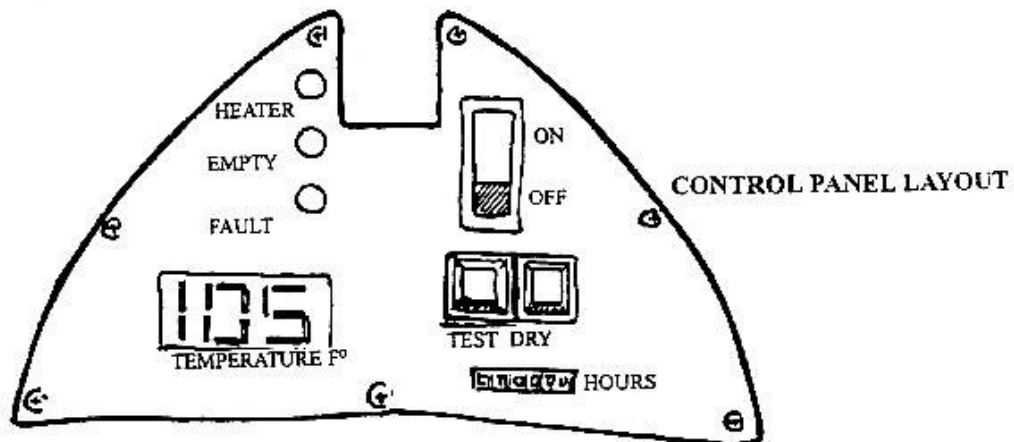
Figure 2B. Centurion Transpirator II Features.



SIGHT TUBE



TWIST LOCK POWER
CORD AND RECEPTABLE



SECTION 3. DESCRIPTION OF DEVICE

The CENTURION TRANSPIRATOR II SYSTEM consists of four separate parts: Unit, Power Cord, Delivery Tube and Muzzle Mask, plus in accessory kit (including disinfectant). The key features of the system are illustrated in Figure 2A and Figure 2B.

3.1 TRANSPIRATOR II UNIT

The CENTURION TRANSPIRATOR II unit portion of the system is an impact-resistant plastic cabinet containing a long-life air turbine, solid-state electronic controls and a transpirator module. Weather-resistant external controls are recessed beneath the carrying handle for protection.

The CENTURION TRANSPIRATOR II module humidifies air from the turbine using a 2 1/2 hour supply of distilled water from an internal reservoir. As the term "Transpirator" implies, the humidification is accomplished in vapour (gas) phase to avoid generation or transmission of aerosol water droplets and propagation of bacteria or other organisms.

Over 1000 watts of energy are required to vaporize water and saturate delivered air to 105F. The CENTURION TRANSPIRATOR II unit is designed to control this high energy level in track and barn environments with maximum safety for both operator and animal. Some of the safety features are as follow:

- **Electric Shock Protection:** The turbine is grounded and all other internal components are electrically isolated. All accessible external "dead-metal" metal parts are electrically isolated.

The cabinet is sealed such that it can be opened for service only at the factory. Since there are no internal service requirements and no access, there is no internal electrical hazard for operating or maintenance personnel.

- **Fire Protection:** THE CENTURION TRANSPIRATOR II unit has a circuit breaker in the power switch and is internally fused. Additional overheating protection is provided by an overload switch on the turbine motor and by a fusible link in the heating element. All plastics used in fabricating the CENTURION TRANSPIRATOR II unit contain flame-retardants and are self-extinguishing.
- **Manual Restart Required After Power Interruption:** The power switch latches OFF when power is interrupted, even momentarily. This is to prevent unattended restart and potential alarm to horse after a barn power failure or unintended power cord disconnect.

- **Output Burn Protection:** The 105F +/-3F temperature control circuit has an over temperature cut out at 109F. This system is backed up by two independent over temperature circuits that latch all power off, plus a fusible link in the heating element. In addition, the entire system is power-limited to a maximum output temperature of 120F in the unlikely event of three simultaneous safety circuit failures.

- **Protection-Circuit Protection:** To insure proper setting of safety circuits and maintenance of electrical integrity, the CENTURION TRANSPIRATOR II unit must be returned to the factory for any internal service. Any evidence of tampering with sealed fasteners voids all warranties.

- **Designed For Rough Handling:** The CENTURION TRANSPIRATOR II unit is designed for every day use in the barn and track environment. It may be shipped by UPS or common carrier in its original, or certified replacement, carton without any special preparation, except for removal of water.

- **Tip-Over/Out-Of-Water Protection**
Kinked-Tube/Over temperature Protection

- **Delivery Tube Short-Circuit And Disconnect Protection**

- **Designed For Easy Disinfection:** Disinfection of the CENTURION TRANSPIRATOR II system is necessary to prevent propagation of organisms or transmission of infections from animal to animal. **Clean (aseptic) operation can only be accomplished with thorough cleaning procedures, which are the responsibility of the USER.** The CENTURION TRANSPIRATOR II unit is designed for easy disinfection of all airway surfaces leading to and in contact with the horse. We have selected Sanazide disinfectant because it is safe to handle and is non-toxic to either man or horse. It is effective against all pathogens bacteria, viruses, fungi and spores when used according to the manufacturer's instructions.

- **Temperature Control Circuit Test:** A special feature on the CENTURION TRANSPIRATOR II unit is the "TEST" switch which checks the calibration of the electronic temperature controller. When the TEST switch is held down while in the DRY mode, the digital TEMPERATURE display will go from "EEE" to "104-106", indicating that the Transpirator unit's control is OK. This can avoid sending an entire machine back to the factory for service when the problem may be corrected by simply changing to a new Delivery Tube.

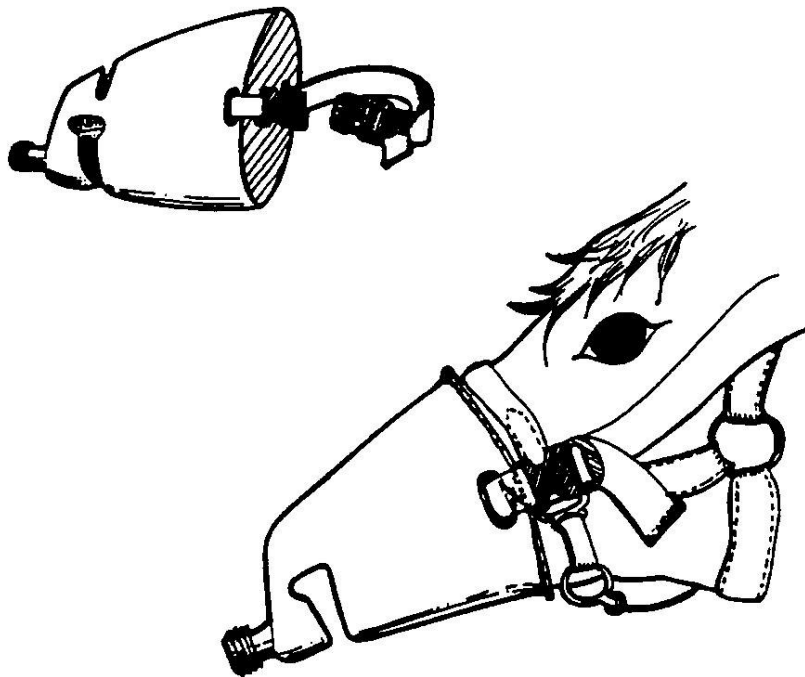
3.2 DELIVERY TUBE

The Delivery Tube is a flexible plastic tube 12 feet long with means for sensing the temperature of the humidified air. It is insulated both to avoid excessive heat loss and to protect the tube against the normal abuse it might suffer in an equine environment. The tube connects to the humidified air outlet of the Transpirator II unit while the temperature sensor plugs into a receptacle above the humidified air outlet. The Delivery Tube should be disinfected daily, and it should be thoroughly dried before storing.

3.3 MUZZLE MASK

The Muzzle Mask fits over the nose of a horse (see FIGURE 3) and is held in place by a strap, which passes behind the head. A snap-lock connector on the strap facilitates securing the Mask to the horse. A diffuser in the Mask prevents high velocity air from contacting sensitive nasal tissues. Drain holes prevents the build-up of secretions within the mask. The Muzzle Mask must be disinfected before every use.

FIGURE 3. PROPER PLACEMENT OF THE MUZZLE MASK



3.4 POWER CORD

A thirty-foot Power Cord is supplied with each CENTURION TRANSPIRATOR II system. It connects to the CENTURION TRANSPIRATOR II unit via a twist-lock socket, and has a standard grounded plug at the outlet end. The CENTURION TRANSPIRATOR II unit should only be operated on properly grounded circuits. Do not plug into "cheaters" or extension cords. Should damage to the cord occur, replace the cord immediately with a CENTURION TRANSPIRATOR II Power Cord only. Do not use extension cords with the CENTURION TRANSPIRATOR II system.

3.5 ACCESSORY PARTS

The following items contribute toward ease and effectiveness of operation of the CENTURION TRANSPIRATOR II unit.

3.5.1 Disinfectant

Sanizide is used to disinfect the Delivery Tube each day it is used and to disinfect the mask before each use. Sanizide disinfectant is available through CENTURION.

3.5.2 Miscellaneous Accessory Parts

Miscellaneous accessory parts include: disinfectant tee, disinfectant swabs, disinfectant bottle, drain tube, tube restraint and accessory carrying bag.

SECTION 4. TECHNICAL SPECIFICATIONS

ELECTRICAL: 115 volts ac 220 volts ac
 60 Hertz 50 Hertz
 1500 watts 1500 watts
 13 amps 7 amps
 Grounded
 30' Power Cord
 Over current Protection

MECHANICAL: 24.5" x 11" x 18" (L x W x H)
 Shipping weight: Box 1: 43 lbs (20kg)
 Box 2: 26 lbs (12kg)
 Water capacity: 3.0 quarts
 Water resistant (not waterproof)
 Less than 70 dBA noise level
 12' Delivery Tube

ENVIRONMENTAL: 20-95F (-6 to 35°C) operating ambient
 10-100% relative humidity
 10-degree maximum tilt
 -40 to +160F (-40 to 70°C) storage ambient

OPERATIONAL: Start up within 5 minutes at 70F(21C) ambient
 Flow rate: greater than 300 litres per minute
 Runs 2.5 hours at 70F(21C) before refill
 102-108F (39-42°C) output wet bulb temperature
 109F (42.7°C) maximum output dry bulb temperature
 Requires distilled water
 Out of water indicator
 Minimal bacterial hazard if disinfected per manual.

SECTION 5. OPERATING INSTRUCTIONS

5.1 RECEIVING INSPECTION

The CENTURION TRANSPIRATOR II system is shipped in two cartons. One contains the Transpirator II unit. The second contains the Muzzle Mask, Accessories, Delivery Tube, Power Cord, and Disinfectant.

Upon receipt of your CENTURION TRANSPIRATOR II system, examine the shipping cartons to verify that no obvious damage occurred during shipment. If damage is found, notify the shipper and Centurion Customer Service immediately USA 800-387-8326, UK 028 94433666.

Remove the shipping containers and inspect the CENTURION TRANSPIRATOR II unit for visible damage. Check that the following items are present:

BOX 1 OF 2

Centurion Transpirator II unit

Owner's Manual & Operation Check List

BOX 2 OF 2

Accessory Carrying Bag

Tube Restraint

Muzzle Mask

Disinfectant

Disinfectant Tee

Drain Tube

SAVE SHIPPING CARTON - BOX 1: The CENTURION TRANSPIRATOR II unit must be returned to the Service Centre for non-routine service (see 6.4)

Before operating the CENTURION TRANSPIRATOR II unit, take a few minutes to become familiar with the various monitors and controls. The control panel under the handle of the CENTURION TRANSPIRATOR II unit has the following components:

- | | |
|------------------------|-------------------------------|
| - Power ON/OFF Switch | - Empty Light (amber) |
| - DRY Switch | - Fault Light (red) |
| - TEST Switch | - Digital Temperature Display |
| - Heater Light (green) | - Elapsed Time Indicator |

One end of the CENTURION TRANSPIRATOR II unit contains a twist-lock plug for the Power Cord. The other end has the connections for the Delivery Tube (humidified air and temperature control).

Air filters on the sides of the CENTURION TRANSPIRATOR II unit normally function as inlet filters. When the fan is automatically actuated, due to high ambient temperatures, the left side filter becomes an exhaust port. A drain valve and a sight tube are on the right side of the CENTURION TRANSPIRATOR II unit, while the drain port is on the left side.

5.2 NORMAL WARM-WEATHER OPERATION

Operating instructions on the machine label (see label below) are reminders of procedures described in this section. Veterinarian, trainers, groom and others responsible for administering CENTURION TRANSPIRATOR II therapies must read and understand this Manual to provide aseptic and safe therapy.

OPERATING INSTRUCTIONS

1. Read Manual before operating.
2. Disinfect Mask before each use. Disinfect Tube prior to daily use. Wash air inlet filters weekly.
3. Plug Power Cord into grounded 15-amp outlet (13A 220vac). Do not use extension cords or cheaters. Keep cord and machine out of horse's reach. Do not operate in direct rain or on wet ground.
4. FILL WITH DISTILLED WATER ONLY. Keep level while filling. Do not overfill.
5. Test controls and flow rate daily. Check output temperature with thermometer before each use. If stable between 102 and 108F, connect Tube to Mask then to horse.
6. DO NOT USE IF TEMPERATURE IS ABOVE 109F.
7. DO NOT REFILL WHILE OPERATING.
8. Drain and dispose of water at end of day.
9. DO NOT OPEN CABINET. Refer all non-routine service to factory.

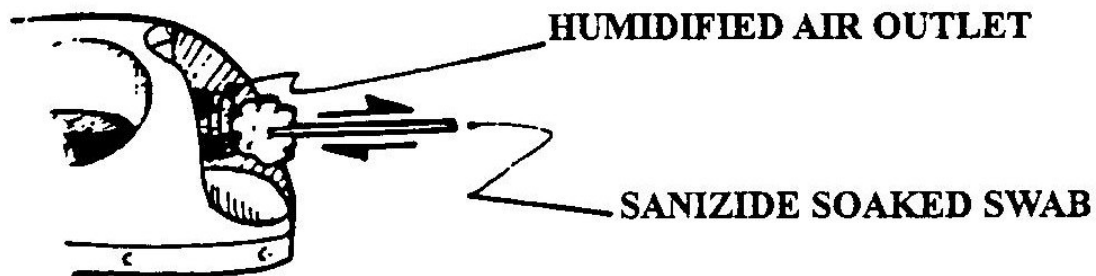
This section is divided into the following three parts:

- 5.2.1 Daily Start-Up Procedure
- 5.2.2 Connecting the CENTURION TRANSPIRATOR II to Horse
- 5.2.3 Preparing for Overnight Storage

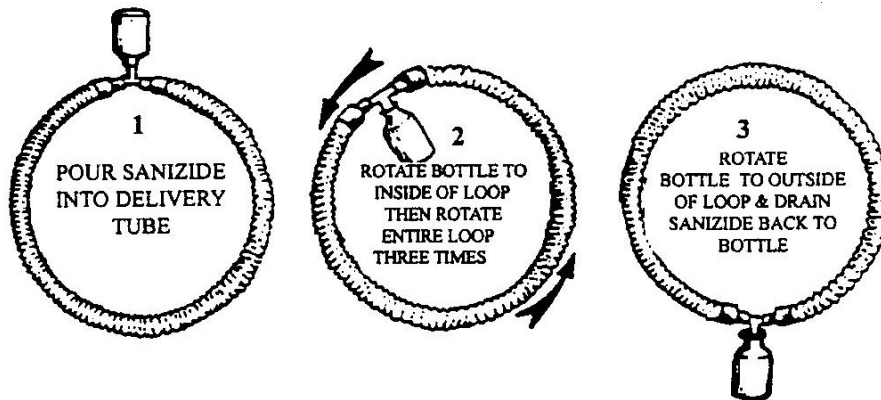
5.2.1 Daily Start-UP Procedure

If storage temperature has been above freezing or if the Cold Weather Start-Up Procedure (5.3) has been completed, the following sequence is recommended to start a day of treatments:

- A. Disinfectant the System: Water in the CENTURION TRANSPIRATOR II unit is pasteurised by an internal heating process before vaporizing. Airway surfaces that are not pasteurised by temperature must be disinfected with Sanazide.
- CENTURION TRANSPIRATOR II Unit Output - The air outlet should be cleaned with alcohol or soaked Sanizide swabs.



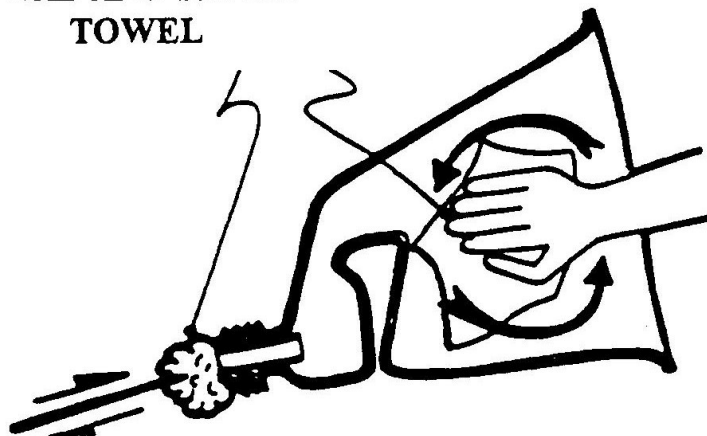
- Delivery Tube - Connect disinfectant tee (T) to Sanizide squeeze bottle containing at least 200 ml (one-half squeeze bottle) of disinfectant solution. Connect both ends of the Delivery Tube to the disinfectant tee and empty disinfectant into Delivery tube. Now, rotate loop of tubing with disinfectant tee two or three times, bicycle-wheel-fashion, to wet all internal surfaces. Drain back into squeeze bottle for use in disinfecting Muzzle Masks and disconnect Delivery Tube (keeping both ends out of dirt). Hang Mask-end of Delivery Tube off floor with the tube restraint strap and connect other end to the **CENTURION TRANSPIRATOR II** unit output barb.



- Muzzle Mask - To avoid spreading infections from horse to horse, it is especially important to disinfect the Muzzle Mask after each treatment.

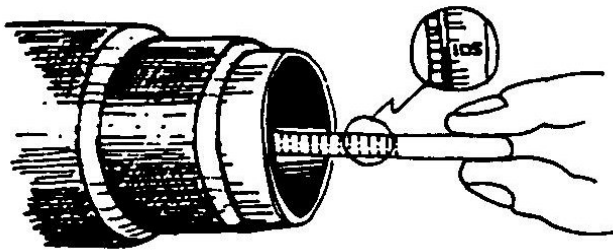
Wash any loose dirt from the Mask with water. Wet all Mask surfaces with a clean paper towel soaked in Sanizide solution. Wet inner surfaces of the connector with Sanizide solution using a swab. After three minutes and before connecting to a horse, wring (squeeze) out excess Sanizide from paper towel and wipe excess Sanizide from Mask surfaces. Hang Mask and end of Delivery Tube off ground to keep clean during remainder of check-out procedure.

SANIZIDE SOAKED SWAB AND PAPER TOWEL



- B. Connecting Delivery Tube to TRANSPIRATOR II Respiratory Unit:
Remove protective cap and attach tube to output barb. Plug temperature sensor connector of Delivery Tube into receptacle above barb. If connectors have been wetted by Sanizide, dip them in distilled water and shake/blow dry three times (use protective output cap as water cup). Hang the other end of tube by restraint strap to keep it off the ground and clean.
- C. Connecting Power Cord:
Connect Power Cord to Twist-lock plug in TRANSPIRATOR II unit base and to grounded 115-volt (220 volt for 100-326) electrical receptacle. Make sure that electrical circuit is rated to handle an additional 13 amperes (7 amperes for 220 volt device) before plugging TRANSPIRATOR II unit in. (if uncertain, consult licensed electrician.) AVOID DIRECT EXPOSURE TO RAIN (CENTURION TRANSPIRATOR II IS WATER-RESISTANT BUT IS NOT WATERPROOF). FOR SAFETY, DO NOT CONNECT OR OPERATE WHEN EXPOSED DIRECTLY TO RAIN OR WHEN MACHINE OR OPERATOR MUST STAND ON WET GROUND.
- D. Draining Residual Water:
Open the drain valve on the side of CENTURION TRANSPIRATOR II unit, below sight tube.
- E. Testing Out-Of-Water and Tip-Over Protection:
Switch power ON while reservoir is empty. Machine should stop within one minute with amber EMPTY light lit. Switch power OFF.
- F. Filling Reservoir:
Close drain valve and fill reservoir with distilled water (greater than 5000,000 ohm (5M Ω) resistivity). Keep machine level while filling. Add water slowly to allow sight tube to respond. Do not overfill -- open drain valve to reduce level, if necessary. **Do not use tap or spring water.**
- G. Testing Controls and Flow Rate:
- Press power switch ON. Green HEATER power light should light and digital temperature display should read ambient temperature.
 - Press the DRY switch. In the DRY mode this switch should light up yellow, the digital temperature display should read "EEE" and the green HEATER light should be off.
 - Test the control circuit by depressing the TEST switch for about ten seconds. The TEST switch will operate only in DRY mode. The digital display should read 104-106 and the green HEATER light should be lit or cycling.
 - Press the DRY switch. The switch should go dark; the green HEATER light should be lit.

- Test temperature control by running the CENTURION TRANSPIRATOR II unit until HEATER light starts to cycle. This should require less than five minutes (at 70F ambient) and, after cycling starts, the digital temperature display should read between 102-108F.
- Insert thermometer into end of the Delivery Tube. After one minute, the thermometer should read within 2F of the digital display. If thermometer reads over 108F or more than 2F above digital display, rinse Delivery Tube temperature sensor connectors in distilled water (use protective output cap as water cup). The output should feel warm and moist with condensed water blowing out the end of the tube.



**MANUAL CHECKING
OUTPUT TEMPERATURE
AT DELIVERY TUBE END**

- H. Kinked-Tube and Over-temperature Protection Test: While the CENTURION TRANSPIRATOR II unit is operating at 102-108 on the display, block flow at the end of the Delivery Tube with your hand. After a few moments, the machine should shutdown with red FAULT light lit. Restart by switching power OFF then back ON.
- I. Attaching Muzzle Mask to Delivery Tube:
The CENTURION TRANSPIRATOR II system is now ready for connection to a horse (see next section 5.2.2).

5.2.2 Connecting TRANSPIRATOR II to Horse:

- a. Prepare TRANSPIRATOR II System: The CENTURION TRANSPIRATOR II system may used any time within 24 hours of completion of the Daily Start-Up Procedure (5.2.1) and at least three minutes after the last Sanizide disinfect of the muzzle mask between horses.

- b. Set Up TRANSPIRATOR II unit: Check that water reservoir is full (with machine on level ground). Connect electrical power cord to properly grounded and rated receptacle. Do not use "cheaters" or extension cords. Route the power cord out of the horse's reach and so as not to be a tripping hazard.

Place the CENTURION TRANSPIRATOR II unit on the ground out of the horse's reach, but close enough to provide slack in the Delivery Tube. Check that the machine is f'=fly on the ground (no rocking) with less than 10 degrees of tilt. The preferred location is outside the stall to the left side such that the fill cap and sight tube face out and the delivery-end is near the horse. The Delivery Tube should be held off the ground with the tube restraint strap clipped to the stall doorframe. This is to provide strain relief and to prevent the horse from stepping on the tube.

- c. Test Output Temperature: Before connecting to a horse, start and run TRANSPIRATOR II unit until green HEATER light is cycling and the display is stable between 102 and 108 and the Delivery Tube measures within 2F of display with a thermometer (see 5.2.1. C.& H). DO NOT USE ON A HORSE IF TEMPERATURE EXCEEDS 109F.
- d. Connecting Muzzle Mask to Horse: With first time, or skittish horses, it is usually best to "introduce" horse to mask with air flowing, allowing the horse to voluntarily explore the mask with its nose. Once the horse seems comfortable, secure the mask with the head straps, pulling the diffuser in the bottom of the mask to within one inch of the horse's nose.

If the above 4 procedures prove to be difficult with an extremely balky horse, turn the CENTURION TRANSPIRATOR II unit off and try connecting Delivery Tube and Mask when the air flow stops. Once the horse is calm, but not more than five minutes after TRANSPIRATOR II unit was operating at a stable temperature (102-108F) output, restart the TRANSPIRATOR II unit. Be prepared to make a quick disconnect during the procedure and employ only experienced horse handlers. (In our experience, fewer than 1% of horses treated have been difficult to get started and none have been a problem during later treatment.)

With most horses, the Mask may be attached separately and the Delivery Tube then connected later to the Mask.

Most horses will become drowsy within 15 minutes on the CENTURION TRANSPIRATOR II Unit and will be content to stand for extended periods.

Some horses may become restless because they will not urinate while connected to the CENTURION TRANSPIRATOR II unit. The problem will usually be resolved with a brief disconnect to let the horse go to his favourite spot. Most horses will urinate within a minute after a TRANSPIRATOR II treatment has been completed. This may be a method to schedule urine sample collection and to reduce "whistle time."

- e. Treatment Time: The standard treatment time is two hours. A full reservoir should provide at least 2 1/2 hours to operation. There is no known harm in treating for 2 1/2 hours and no hazard to the horse when a machine runs out of water and automatically shuts down. Normally, however, the treatment will be terminated before the water is all gone and it is best to remove the mask before switching the machine OFF.
- f. Disconnecting- Muzzle Mask From Horse: Remove the Muzzle Mask and operate in DRY mode for 2-5 minutes before switching off TRANSPIRATOR II unit power. Although there are no hazards from the unit, behaviour of horses is unpredictable. The machine is designed to shut off automatically when it runs out of water. Normally, however, we recommend NO STARTING OR STOPPING OF CENTURION TRANSPIRATOR II RESPIRATORY UNIT WHILE CONNECTED TO THE HORSE.
- g. Disinfect Mask Between Horses: After every treatment, the Muzzle Mask should be washed with water, and disinfected with Sanizide solution per 5.2.1, a. & b. Proceed to next horse and repeat 5.2.2.

5.2.3 Preparing for Overnight Storage

After the last treatment of the day, the CENTURION TRANSPIRATOR II Unit should be switched into the DRY mode for five minutes to dry out the Delivery Tube for storage. During this procedure, the reservoir should be drained. The draining rate can be speeded by intermittently holding the heel of your hand over the end of the Delivery Tube. If you do not want the water to drain on the ground or floor, attach a 1/4" inside diameter plastic drain tube to the drain barb connector and route to a bucket or floor drain. It will be necessary to block the end of the Delivery Tube to drain the reservoir when a drain tube is attached. Press the DRY switch and immediately switch power off. Close drain valve. Wipe exterior of CENTURION TRANSPIRATOR II unit clean with a damp cloth.

The CENTURION TRANSPIRATOR II Unit may be stored with Delivery Tube and Muzzle Mask attached. When these are detached for long-term storage or shipment, however, the TRANSPIRATOR II unit output barb connection and Delivery Tube should be capped to keep out dirt.

5.3 COLD-WEATHER OPERATION

IT IS ESPECIALLY IMPORTANT TO BLOW ALL WATER OUT OF THE RESERVOIR AND TO WIPE FILL-TUBE AND CAP DRY BEFORE STORING THE CENTURION TRANSPIRATOR II RESPIRATORY UNIT BELOW FREEZING TEMPERATURES.

If water has frozen in the machine, the following procedure should enable start-up and operation. In windy conditions, with temperatures below 40F, and/or supply voltage is below 115 volts (220 volts), the delivery temperature may never reach 105F. Although the therapy may not be as effective, there is no problem in operating the CENTURION TRANSPIRATOR II unit under these conditions, providing that control and safety circuits check out OK.

If either water or ice is visible in the sight tube, proceed with the next steps. If not, add about one and one-half quarts (1.5 litres) of distilled water to the reservoir, and then proceed.

- a. Connect Delivery Tube and Muzzle Mask to the CENTURION TRANSPIRATOR II Unit.
- b. Connect Power Cord to CENTURION TRANSPIRATOR II Unit and to grounded 115 volts (220 volt for 100-326) receptacle.
- c. Press power switch ON and allow CENTURION TRANSPIRATOR II unit to run until ice thaws in sight tube and water level changes when the machine is tipped or rocked. If the machine shuts down with amber EMPTY light on, restart by switching power on again. Repeat restarting until the ice thaws. If machine keeps shutting down after 15 minutes of restarting, it should be taken to a warm room to thaw. Once the ice is clear, follow procedure 5.2. Warm-Weather Operation.

5.4 OPERATING CAUTIONS

<u>HAZARDS</u>	<u>CORRECT ACTIONS TO AVOID HAZARDS</u>
Electrical	<ul style="list-style-type: none">- Connect only to properly rounded and rated electrical circuits.- Do not connect or operate when exposed directly to rain or when Machine or operator must stand on wet around.- Do not use electrical adapters (cheaters) or extension cords.- Use only CENTURION TRANSPIRATOR II power cords.
Burn	<ul style="list-style-type: none">- AVOID CONTACT WITH HOT DRAIN WATER.- Do not open fill cap during operation.
Chemical	<ul style="list-style-type: none">- Observe manufacturer's cautions on labels of Sanizide disinfectant base and activator. If either base or activator gets into your eyes, flush immediately with water and contact a physician.
Infection	<ul style="list-style-type: none">- Use only Sanazide disinfectant.- Always disinfect CENTURION TRANSPIRATOR II Unit and Delivery Tube at beginning of treatment day.- Always disinfect Muzzle Mask between horses.
Horse Sense	<ul style="list-style-type: none">- Secure horse by halter. Do not depend on Mask and Delivery Tube as restraint.- Keep machine and electric wires out of stall and out of horse's reach.- Do not use CENTURION TRANSPIRATOR II unit if delivery temperature exceeds 109F.- Do not treat horse when ambient temperature exceeds 90F.- Do not leave horse unattended during treatment.- Always consult veterinarian before treating sick or medicated animal.

SECTION 6. SERVICING

Service requirements are minimal. Wipe dirt off the outside of the CENTURION TRANSPIRATOR II Unit occasionally. Clean the filters weekly, or as required. Clean the reservoir at least once every three months.

6.1 FILTERS

The external foam filters should be cleaned once a week. Access the filters by using a coin or screwdriver to remove the inlet filter covers. Remove the filters. Wash them in mild soap and water. Rinse and squeeze all excess water out. Install the filters in their respective locations. Make sure that the filters make firm contact with the cabinet around their entire perimeter to prevent bypass, which could serve as a path for dirt to enter the CENTURION TRANSPIRATOR II unit. Place the inlet filter covers over the filters and secure the quick connects.

Replace filters every six months or when they become worn looking, whichever comes first.

6.2 WATER RESERVOIR

Use only distilled water (resistance greater than 500,000 ohms) in the CENTURION TRANSPIRATOR II unit. The use of tap water will void the warranty and will lead to extra maintenance.

To remove mineral deposits from the reservoir, drain unit completely then pour in one cup white vinegar and two cups distilled water. Start normal operation. Operate for five minutes at 102-108F then shut system off. Drain vinegar solution. Flush twice with distilled water (about three cups per flush). Before connecting to horse, operate machine until there is no vinegar odour in delivery.

6.3 TROUBLESHOOTING PROCEDURE

The following table lists symptoms of problems that might be encountered in the field. Other than checking connections, Delivery Tube replacement is the only corrective action that can be performed outside the factory. The diagnostic or corrective actions for each problem symptom should be done in sequence. If the problem is not corrected, record your observation on the next page and call the CENTURION SERVICE CENTRE at 1-800-387-8326 (USA) or 028 9443 3666 (UK).

PROBLEM SYMPTOM

DIAGNOSTIC OR CORRECTIVE ACTION

No start, no digital display and
No green HEATER light.

- * Turn power switch OFF then back ON
(momentary power interruption latches power OFF.)
- * Check power cord connections.
- * Check electrical supply circuits.
- * Check power switch boot.
 - Remove boot and lubricate with Vaseline if unit stops when finger is remove from power switch.

Digital display reads "EEE"

- * Blower running
- * No green HEATER light
- * No DRY switch light

- * Check Delivery Tube sensor connector.
- * Press DRY switch for DRY mode.
 - Dry switch should light up.
 - Display should read "EEE"
- * Depress TEST switch in DRY mode.
 - Display should read 104-106.
 - Green HEATER light should be on or cycling.
- * Replace Delivery Tube and restart in RUN mode.

Digital display is "---"

- * Blower running
- * No green HEATER light
- * No DRY switch light

- * Unplug Delivery Tube sensor connector from pigtail receptacle
 - Digital display should read "EEE".
- * Replace Delivery Tube and restart in RUN mode.

Amber EMPTY light on.

- * Blower stopped
- * No green HEATER light
- * Water visible in sight tube
- * Unit displays "105" or less
- * Water not visible in sight tube

- * Check that fill cap is tight.
- * If water is frozen refer to 5.3.
- * Remove fill cap, switch to DRY mode and block delivery Tube intermittently until you hear bubbling through fill port.
- * Clean reservoir with white vinegar solution. (section 6.2).
- * Drain and measure volume of remaining water.
- * Refill and try again.

Red FAULT light on.

- * Blower stopped
- * No green HEATER light
- * Water visible in sight tube
- * Digital display "105" or less

- * Check for kink in Delivery Tube.
- * Check sight tube for over-filled reservoir.

Output temperature below 102F

- * Ambient temperature is above 20F
- * No wind

- * Check TRANSPIRATOR II unit to tube connection for air leaks.
- * Check that Mask is connected to Delivery Tube
- * Move to sheltered location if ambient is below 40F and windy.
- * Turn off other electrical loads or plug into another circuit if voltage is below 115 volts (210 volts for 100-326).

Warranty:

Your Centurion Transpirator II, has a one year warranty from the date of purchase or first day of rental. This unconditional warranty covers any problem – plus labour and replacement parts (freight is excluded). The hose, mask and power cord are also covered by the warranty.

NOTE: Any repairs or service work carried out on the Centurion equipment by unauthorized person or company will void the warranty immediately.

An extended warranty package is available to cover any problems that might arise after the first year. This affordable program covers all parts and labour – freight excluded.

The warranty is honoured from any of our Centurion Service Centres, around the world.

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